

## AN AUTOMATED CONTENT HANDLING SYSTEM AND RELATED METHODS

### RELATED INVENTIONS

The present invention is a continuation-in-part of U.S. Application No.  
5 09/325,040 filed on June 7, 1999 entitled *Document Delivery System for  
Automatically Printing a Document on a Printing Device*, by Brewster, et al.

### TECHNICAL FIELD

This invention generally relates to the printing field and, more particularly, to  
10 a document delivery system for automatically printing a document on a printing  
device.

### BACKGROUND

In the mid-1400's, Johann Gutenberg revolutionized how information is  
15 disseminated through his invention of the movable type press. With the publication of  
the Mazarin Bible, documents which were once held in the exclusive domain of a  
chosen few were now widely available to the masses. Nearly 550 years later, the  
mass media revolution that Gutenberg started is alive and well, complete with  
newspapers such as the New York Times and the Washington Post, magazines such as  
20 Newsweek and Sports Illustrated, and literally thousands upon thousands of other  
publications.

While these thousands of publications cover a wide range of interests, from  
news to sports to fashion to model rocketry, they have one thing in common: they are  
intended to be read by a mass market. Unlike the pre-Gutenberg days, where a  
25 document would literally be read by only one person of a very small number of  
people, it is not economically viable for today's publications to have such a small  
readership, due at least in part to high marketing, production and distribution costs. In  
fact, many of today's publications are funded to a very large extent by the advertising  
contained within them. These advertisers are attracted to publications that can  
30 consistently deliver a large, reliable audience of consumers that will be exposed to  
their advertising.

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While this mass-market publication model has worked well for hundreds of years, it is not without its problems. One such problem is that a typical reader of a publication has a wide variety of interests, and no single mass market publication will be able to satisfy all of these interests. For example, a reader who is interested in international news, golf, fly-fishing, Genealogy, and computers may have to subscribe to several different publications to satisfy these interests. Of course, since these publications are intended for the mass market, they will also contain a significant amount of material that our reader is not interested in and will not read. It goes without saying that if there is a significant amount of material a read isn't reading, there is a significant amount of advertising that the reader isn't reading either – as well as a significant amount of paper that is wasted. Advertisers know this, and agree to pay considerably less to a mass market magazine or newspaper per 1000 exposures to their ad than they would pay to a direct-mail generator that can provide a more specific guarantee that the people exposed to their ad are of a demographic group that will be much more likely to read their ad and be interested in it.

In addition, it is neither cost-effective nor time effective for most readers to subscribe to and/or read a large number of publications. Generally, the typical reader will only subscribe to a few publications that are of the most interest to them. The reduced readership level of the publications our typical reader chooses not to subscribe to, even though she might be interested in at least some of the editorial and advertising content contained inside, means that the publication receives less subscription and advertising revenue than they otherwise would. If many other readers make the same decision, the continued health of the publication may be in jeopardy, and the publication may be forced out of business. In fact, many publications do go out of business yearly for failing to attract a sustaining number of advertisers and readers – even if there are a large number of readers that would be interested in reading their publication, and a corresponding number of advertisers anxious to have these readers exposed to their ads. In general, publications that fail to attract a substantial mass market of people willing to pay for and/or read them cease publication. This is a shame, since many of these publications would enrich the diversity of information available to all readers, and would provide an avenue for lesser known writers and artists to practice their wares.

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In more recent years, a new type of publication has emerged: the electronic publication. Readers of these publications typically sign into the Internet through their computer, and read the publications online. Some of these publications, such as CNN.com and pointcast.com, allow users to state personal preference on what type of material they would like to read. Often, these personalized publications include advertising, usually in the form of a banner ad that is placed on along a periphery of the visual display (top, bottom, side, etc.).

While these electronic publications have been an interesting development in the distribution of information, they still represent only a tiny fraction of the information that is published under the more traditional post-Gutenberg model. Many readers of these electronic publications complain that they are very difficult to read (on the video display), especially for long periods of time. While it might be convenient for a reader to sign onto the Internet to look at the CNN.com web site for a brief summary of late breaking news, this reader would most likely only spend a few minutes at the site, and would likely still subscribe to the more traditional print media such as Newsweek or the Washington Post. They would also likely spend significantly more time reading the more traditional printed publication than they would spend reading the electronic publication, and correspondingly, spend more time being exposed to the ads in the traditional printed publication. Accordingly, printed publications continue to flourish today – more than five centuries after Gutenberg made them possible – and after more than a decade after the innovation of the electronic publication.

While these printed publications have certainly benefited modern society, no significant attempt has been made thus far to solve the underlying problems with these publications discussed above. Just such a solution is provided herein.

### **SUMMARY**

In accordance with the teachings of the present invention, a content handling system and related methods is presented. According to a first embodiment, a method is introduced method comprising issuing a plurality of instructions to a requesting computer to render content, the plurality of instructions including at least a subset which are interpreted to render an iconic selector associated with a service, wherein

[illegible]

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**Fig. 8** shows how the print schedule of Fig. 7 can be modified by the user;

**Figs. 9A-9B** shows a document printed by the printing device according to

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**Figs. 11A-11D** show a document printed by the printing device according to

**Fig. 13** illustrates a block diagram of an example content handler, according to

**Fig. 14** illustrates a block diagram of an example method of content handler

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## DETAILED DESCRIPTION

**Fig. 1** illustrates a block diagram of a document delivery system of one embodiment of the invention. Document delivery system 10 contains document server 100. In the preferred embodiment, document server 100 is operatively coupled via network 200 to a variety of personal computers, printing devices, and other electronic devices, collectively referred to as devices 300. Document server 100 contains edit module 120, transmission module 150 and knowledge module 170. Edit module 120 receives inputs from one or more content providers 50, and/or one or more advertising providers 80. Distribution module 400 is operatively coupled to document server 100. In a preferred embodiment, document server 100 is a minicomputer/server, such as an HP 9000 server sold by the Hewlett-Packard Company, although those skilled in the art will appreciate that document server 100 could be any type of other computing or electronic device(s) that performs the functions described herein and still fall within the spirit and scope of the invention. Network 200 is preferably the Internet, although an Intranet, local area network, or other type of public or private network, either wired (e.g., telephone, cable TV, etc.) or wireless (e.g., satellite, radio, cell phone, etc.), could also or additionally be used. According to one aspect of the present invention, to be developed more fully below, document delivery system includes automated content handling facilities. More particularly, devices 300 include a content handler (see, e.g., Fig. 13), which is responsive to an iconic selector embedded in rendered content to automatically subscribe a user to receive available content (e.g., electronic publications, multimedia content, services, etc.), index available content, and/or automatically print available content without modifying the rendered content and without requiring further user input.

Devices 300 are shown in Fig. 1 as being capable of being configured in a wide variety of ways. For example, personal computer 310 is shown connected to

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Turning briefly to Fig. 13, a block diagram of an example content handler 401 is presented, according to one embodiment of the invention. According to one

embodiment, to be described more fully below, content handler 401 resides within one or more of devices 300 and, in response to user interaction with an iconic selector rendered within a user interface (e.g., web page, email, word processing document, etc. (not shown)) of device 300, automatically subscribes a user to periodically  
5 receive content, indexes content for later use and/or automatically retrieves and prints content denoted by the iconic selector without modifying the rendered content on the display and without requiring further user input. Any of a number of user interfaces may be used to utilize the features and functions of printing module 380. According to one embodiment, to be described more fully below, a web page is projected to a  
10 device 300 by document server 100, content provider 50 and/or advertisers 80, wherein the web page includes one or more iconic selector(s) associated with available content. According to one aspect of the invention, the instructions for rendering the iconic selector include an action designator to selectively invoke one or more functions of content handler 401, and a network address denoting the location of  
15 the available content. As used herein, the content may well include an electronic publication, multimedia content, a service and the like.

As shown in Fig. 13, content handler 401 includes one or more controller(s) 402, an automated print function 404, an index/scheduling function 406, a document translation/interpretation function 408, a memory/storage system 410, an input/output  
20 (I/O) interface 412, and optionally one or more applications 413, each coupled as shown. It will be appreciated that, although denoted as separate functional blocks, one or more elements 402-413 may well be combined without deviating from the spirit and scope of the present invention. Similarly, although denoted in the context of a single functional entity 401, it is to be appreciated that one or more elements of  
25 content handler 401 may well be remotely located, i.e., within document delivery system 10. In one implementation, for example, index/scheduling function 406 is located at document delivery server 100. Although depicted in accordance with a hardware paradigm, those skilled in the art will appreciate that content handler 401 and its associated elements 402-413 may well be embodied as a series of executable  
30 instructions which, when executed by a host processor of devices 300, implement the features and functions of content handler 401 to be discussed below. In this regard, Fig. 13 is merely illustrative of the scope and spirit of the claimed invention.

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As shown, controller(s) 402 selectively invoke one or more functions 404-408 and/or applications 413 in response to user interaction with a user interface.

According to one embodiment, the user interface includes iconic selectors, e.g., buttons, which when selected by the user causes controller 402 of content handler 401 to selectively invoke an instance of a function associated with the selector. In this regard, controller 402 communicates with external elements via input/output (I/O) interface(s) 412. In an alternate embodiment, controller 402 provides a user with a user interface from applications 413.

As used herein, I/O interface(s) 412 are intended to include one or more of any of a number of communication interfaces known in the art including, but not limited to, a direct connect communication interface (e.g., a serial interface, a parallel interface, a Universal Serial Bus (USB), an Advanced Graphic Port (AGP), etc.), a local area network interface (e.g., an Ethernet interface, a Token Ring interface, etc.), or a wide area network interface. In this regard, content handler 401 may well communicate with any of a number of external and remote devices using an appropriate one of a plurality of wired and/or wireless I/O interfaces 413.

Automated print function 404 is selectively invoked by controller 402 in response to a user indication to immediately print a document (e.g., within the next several seconds) without first viewing or displaying the document. According to one implementation, automated print function 404 is an embodiment of print manager 380. According to one embodiment, content projected by an external source (e.g., document server 100, content provider 50, advertiser 80, or any third-party provider of content) includes an iconic selector associated with available content, wherein the action designator denotes the "print" function. When the iconic selector is selected by a user, controller 402 receives one or more instructions with at least an action designator and the network address of the content. According to one implementation, user interface provides controller 402 with a name/identifier and storage location of the one or more documents. Controller 402 provides the name/identifier and location information to automated print function 404 to queue the document for printing. As will be described in more detail below, automated print function 404 generates and issues a request to retrieve the identified document(s) from the identified storage location via I/O interface 412. The retrieved documents are stored in memory



locations 414A, 414B, etc. of memory 410. Once retrieved, document translation/interpretation function 408 is selectively invoked to interpret/translate and print the retrieved document, without displaying the retrieved document. According to one implementation, the retrieved documents are queued and printed substantially  
5 instantaneously (e.g., within the subsequent several seconds). In alternate embodiments, the retrieved document(s) are printed according to a print schedule defined by the user. In one embodiment, the instructions are received from a document delivery server 100 within document delivery system 10. It should be noted that the document delivery server 100 may or may not be denoted as the  
10 provider of content within the instructions of the iconic selector. Regardless, as will be described more fully below, a document delivery server 100 receives detects the user selection of the iconic selector to ensure that the computing device 300 includes the content handler 401. If it does not, the user is provided with an opportunity to receive and install content handler 401 in their computing device 300.

15 According to one aspect of the invention, to be described more fully below, the document associated with an iconic selector is retrieved from a provider into memory 410 of content handler 401 and immediately printed without invoking an application associated with the document. That is, translation/interpretation function 408 reads the stored document(s), interprets the textual, image, formatting, etc. content of the  
20 document(s) to print the document on an operatively coupled printer without having to invoke the application associated with the retrieved document(s), and without having to display the document(s) to the user prior to printing.

In an alternate embodiment, an application 413 (e.g., Microsoft Word, Adobe Acrobat, etc.) associated with the document is invoked by controller 402 to print the  
25 document, but neither the document nor the application 413 are displayed to the user so, from the user's perspective, the application is not launched. In either case, automated print function 404 enables a user to immediately print a remote document without having to manually download, launch and print the document, thereby providing the user with the convenience and selection of electronic publications, with  
30 the physical reading experience introduced by the Gutenberg press.

The index/scheduling function 406 is selectively invoked by controller 402 in response to user selection of an iconic selector to automatically subscribe a user to

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Block 2200 checks to see whether a document should be received from document server 100. This is done by checking print schedule 390 which is

preferably stored on a device 300 or document server 100, but may be stored in some other local or remote location. Printing schedule 930 preferably contains information that can be used to determine when documents should be printed by the printing device, such as upon document creation, user requested time, lapse of specified time period, and/or occurrence of one or more external events (e.g., a stock price or index reaching a specified value, a final score of a sporting event, etc.). Printing schedule 390 may be associated with an individual user, a device or a group of users and/or devices. In addition, each entry of printing schedule 390 could result in the printing of one or more documents.

Fig. 7 shows one example of printing schedule 390, of the type that might be used in an enhanced version of HP's Instant Delivery program. In this example, the title of delivery, delivery schedule, next delivery data and time, and the last delivery status are shown. Preferably, the user can select what time a document should be printed, whether it should be printed on a specific day of the week or month, weekdays, or weekends, and whether the printing schedule should expire after a specific period of time or continue indefinitely.

Referring again to Fig. 2, printing module 380 monitors printing schedule 390 to see if a document should be requested from document server 100 or from another source. When block 2200 determines that a document should be requested from document server 100 or from another source, block 2200 is answered affirmatively, and block 2300 automatically requests the document without user intervention from server 100 or from another source, as will be described in greater detail below. Note that if printing module 380 is located on device 300, block 2200 operates in a "pull" mode – where the document is "pulled" from document server 100 or another source to device 300. However, if printing module 380 is located remotely from device 300, such as in document server 100, block 2200 operates in a "push" mode – where the document is "pushed" from document server 100 or another source to device 300. If block 2300 determines that the document is located on document server 100 or at another source accessible via network 200, and if device 300 is currently in a disconnected state where it is not operatively coupled to the network 200, block 2300 will sign on to or otherwise enter a connected state with network 200, so that device 300 is operatively coupled to network 200.

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preferably stored in knowledge module 170. This other information could be ink usage (total usage or usage broken out by ink color), printable media usage (number of pages printed, type of media used, etc.), or other types of information. In addition, another alternate embodiment has been contemplated where some or all of the information contained in the user profile stored in knowledge module 170 came from a source other than the user via printing module 380. For example, publicly or privately available information about the user, and/or the devices 300 he/she/they use, could be acquired from a wide variety of different sources and inserted into the user profile preferably stored in knowledge module 170.

Block 1800 examines the user profile preferably stored in knowledge module 170 to determine whether a product subsidy should be provide to the user. For example, if the information in the user profile indicates that this user has printed off his 1000<sup>th</sup> document, such as a “preferred” document that contains advertising from advertising providers 80 or is otherwise under the control of edit module 120, providing a product subsidy to the user may be warranted. For purposes of this invention, a “product subsidy” could be a print consumable or other product. A “print consumable” is an inkjet cartridge for an inkjet printer, ink for such an inkjet cartridge, a toner cartridge for a laser printer, toner for such a toner cartridge, or any other product or substance that is depleted when a document gets printed, including printer ribbons, etc. Note that the “ink” referred to above would typically be of a permanent variety, but erasable electronic ink, such as that sold by the Eink Company, could also be used.

Note that the product subsidy referred to herein is preferably funded at least in part by advertising revenue received from advertising providers 80 (Fig. 1), but an embodiment has been contemplated where the product subsidy is funded at least in part from the distribution revenue received from content providers 50 (Fig. 1). In either case, information (such as statistical information) about what was printed by whom is preferably provided to content providers 50 and/or advertising providers 80 – preferably as a document that is automatically sent to one or more printing devices according to the teachings of this invention.

Other forms of products that are contemplated to be subsidized by this invention include printable media, such as plain paper, specialty paper, transparencies,

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and the like, and may also include devices 300 such as printing devices, electronic devices, and personal computers. In fact, alternate embodiments have been contemplated where other products, such as a subscription price to a document, or even a product not directly related to the document delivery system shown herein, such as soap or dog food, are subsidized. If block 1800 determines that such a subsidy is warranted, block 1900 requests that distribution module 400 provides such a subsidy to the user. In one embodiment, distribution module 400 simply mails a product such as a print consumable or other product such as the type described above to a user at the address specified in the user profile. In another embodiment, distribution module 400 mails or electronically generates a coupon that the user can use to receive a free or discounted product of the type described above. Regardless of whether block 1800 is answered affirmatively or negatively, flow of control then returns back to block 1300 (Fig. 2) to see if another document has been requested from the printing module 380.

Referring again to Fig. 3, after block 2900 informs document server 100 that the document printed successfully, flow of control moves to block 4100 (Fig. 4), which checks with document server 100 to see what the current version of printing module 380 is. Block 3100 checks to see whether such a request has been received, and when it is, block 3200 sends information concerning the current version of the printing module to printing module 380. Block 4200 compares this information from document server 100 with its own version and determines whether an updated version of printing module is available. For example, if printing module 380 is running version 4.0, and document server 100 indicates that version 4.1 is the current version of printing module 380, block 4200 would determine that an updated version of printing module 380 is available, and flow control would move to block 4300. Block 4300 checks to see whether this updated version of printing module 380 should be requested to be downloaded. While a user would typically be asked whether such a download should be requested or not, and would typically perform this download at a convenient time, such a step could also be performed automatically without user intervention. If such a download is requested, block 4400 is answered affirmatively, and block 3500 downloads the updated printing module, which is then installed in block 4500. Regardless of how blocks 4200 and 4300 are answered, flow of control

moves to block 4600, which checks to see if a disconnected state should be entered. If block 2300 (Fig. 2) determined that device 300 was in a disconnected state when the document was requested, as discussed above (i.e., not operatively coupled to network 200), block 4600 is answered affirmatively, and block 4700 reenters the disconnected state. In any event, flow of control returns to block 2200 of Fig. 2.

Referring again to print schedule 390 shown in Fig. 7, it can be seen that many different types of documents can be requested to be printed. For example, the title of document 11000 specifies a network address, such as an Internet uniform resource locator (URL) that contains the network location of a document to be printed. Note that this URL may be partially or completely hidden from the user, as is the case with the URL for document 15000 (<http://www.beloitdailynews.com>). In this scenario, edit module 120 of document server 100 merely goes out to the Internet at the URL indicated (which would be shown in Fig. 1 as one of the content providers 50), and captures the indicated document, which is then transmitted to a printing device via transmission module 150 and printing module 380, as has been discussed. Alternatively, device 300 could go directly out to the URL itself without assistance from document server 100; in this case, block 2300 (Fig. 2) requests document 11000 from another source – directly from the content provider 50 (at the indicated URL) via network 200.

In contrast, document 12000 is not a document that originates with a content provider 50 via the Internet, but instead is stored directly on device 300, such as a printing device, personal computer, or other electronic device. An example of such a document could be a daily calendar from a program such as Microsoft Outlook, which the user has requested be printed automatically to his printer, without any user intervention, at 7:00 a.m. every weekday morning. In such an embodiment, printing module 380 does not need to request the document from document server 100, since it can access the documents without going through network 200. In this embodiment, block 2300 of Fig. 2 requests the document from another source – device 300. While block 2900 would still preferably indicate that the document was printed, and while block 1700 would still preferably update the user profile in knowledge module 170, printing such a document would preferably not generate any type of credit towards a

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product subsidy, since such a document would not be considered a “preferred” document, e.g., not a document under the control of edit module 120.

Turning next to Figs. 14 and 15, an example operation and implementation of an example content handling system is presented, according to one embodiment of the present invention. More specifically, with reference to Fig. 14, a flow chart describing an automated content handling system implemented by document delivery system 10 is presented, according to one embodiment of the present invention. For ease of explanation and illustration, the method will be developed with further reference to an example user interface (e.g., a web page) depicted in Fig. 15.

Turning first to Fig. 15, an example user interface incorporating one aspect of the present invention is presented in the form of web page content. It is to be appreciated that alternate user interface(s) may well be used such as, for example, electronic mail (email) messages (see, e.g., Fig. 16), word processing documents, and the like may well be used without deviating from the spirit and scope of the present invention. According to the illustrated example embodiment, the user interface is a web page for the HP Instant Delivery Service 15000. As depicted, the web page 15000 includes a “What’s Hot” section with a featured document or publication, 15002. In addition to a hypertext link to the document 15002, the selection of which would result in redirecting the browser to display the document, web page 15000 includes an iconic selector 15004, which when selected invokes the automated print function 404 of content handler 401 without redirecting the browser, displaying the document, etc..

According to one implementation, iconic selector 15004 (e.g., a button) is generated by a provider of the user interface with one or more executable instructions that include an action designator and a name/identifier and location of the linked document embedded within the instructions. According to the illustrated example embodiment, the iconic selector is generated from one or more hypertext markup language (HTML) instructions. According to the teachings of the present invention, the HTML instructions include a call to a delivery server 100 of document delivery system 10, which includes an action designator and a network address for the denoted content. An example call syntax is:

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href=http://Deliveryserver.com/content\_type/useraction/  
?ActionDesignator&parameters&HpiDetect=1  
&HpURL=http://Content.networkaddress.com  
(1)

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In the syntax above, the deliveryserver.com is the network address for document delivery server 100, which receives the command issued upon user selection of the iconic selector, regardless of whether the iconic selector is embedded in content presented by the server 100, or by a third-party content provider. The content\_type denotes whether the content is a publication, multimedia content, a service, and the like. As introduced above, the ActionDesignator denotes whether the content is to be “printed”, “subscribed”, “indexed”, “downloaded” and the like. The associated parameters are included to denote information such as printing time, index category, and the like. If HpiDetect is set to one (1), document delivery server 100 confirms that the requesting device 300 is populated with content handler 401 before issuing the command to print/subscribe/index the denoted content. According to one implementation, if the requesting device 300 does not include the content handler 401, document delivery server 100 provides device 300 with an opportunity to download and install content handler 401. Finally, as introduced above, the content.networkaddress.com denotes the name and/or network address of the available content. Example instructions implementing the foregoing syntax include:

***Subscription:***

25 http://services.instant-  
delivery.com/publication/useraction/?hpaction=subscribe&HpCycle=W1%20MO&H  
pTime=1200&HpiDetect=1&HpUrl=http://www.anadtech.com  
(2)

30 ***Print:***

http://services.instant-  
delivery.com/publication/useraction/?hpaction=print&HpiDetect=1&HpUrl=http://w

004040" 289T960

ww.anadtech.com

(3)

***Index:***

5 http://services.instant-  
delivery.com/publication/useraction/?hpaction=index&HpCategory=Tech&HpiDetect  
=0&HpUrl=http://www.anadtech.com

(4)

10 ***Download:***

http://services.instant-  
delivery.com/music/useraction/?hpaction=download&HpiDetect=1&HpUrl=http://ww  
w.kittyvermont.com/wonderfullyou.wav

(5)

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Fig. 14 illustrates a flow chart detailing the operation of the automated content handling system, in accordance with one example embodiment of the present invention. As shown, the method begins with block 14002 with a user viewing a user interface (e.g., web page 15000) document with links to other available content. In accordance with the teachings of the present invention, the links are iconic selector(s) (15004, 15006, 15008) which, when selected by a user, automatically subscribe, print and/or index available content without modifying the content rendered for the user (e.g., the web page 15000) or requiring further input from the user, except in the instance where the content handler 401 is to be downloaded/installed. In block 20 14004, document delivery server 100 detects user selection of one or more iconic selector(s) 15004-15008. More specifically, as introduced above, upon selecting an iconic selector (e.g., pressing the virtual "button"), a call (e.g., call 2-5, above) is sent to document delivery server 100 to initiate the requested process.

25 Upon receiving the call, document delivery server 100 determines whether the requesting device 300 is populated with the content handler 401, block 14006. As 30 introduced above, document delivery server 100 analyzes the received call to determine whether HpiDetect is zero (0) or one (1). If, in block 14006 document

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delivery server 100 receives a call wherein HpiDetect is zero (0), and content handler 401 is required to fulfill the request, document delivery server 100 prompts the user at device 300 whether they wish to download and install content handler 401 to complete their request. If so, document delivery server 100 provides the user with the opportunity to download and install content handler 401, block 14008. According to one implementation, the download and installation of content handler 401 is automated using a self-extracting and installation executable, or a program to program communication.

If, in block 14006, document delivery server 100 determines that the content handler 401 resides on device 300, document delivery server 100 issues a command(s) to content handler 401 on device 300 including at least the action designator and the network address of the available content, block 14010. As introduced above, controller 402 of content handler 401 receives the command(s) via I/O interface 412 and selectively invokes an appropriate one or more of functions 404 and 406. In block 14012, content handler 401 contacts the provider of the denoted content at the received network address and enables the requested service (i.e., print, download, subscribe and/or index) without modifying the content rendered on device 300 and without requiring further user input.

Accordingly, if the received command included the print action designator, the process continues with block 14016 wherein content handler 401 receives the content in memory 410, and selectively invokes an instance of the document translation/interpretation function 408. In block 14018, automated print function 404 of content handler 401 prints the received document without first displaying the content or requiring any additional information from the user. In block 14020, content handler determines whether any additional action designators (i.e., index or subscribe) were received with respect to the retrieved document. If so, the process continues with blocks 14022 and/or 14026, described below.

If the action designator of the command received from document delivery server 100 was the "index" command, the network address and/or the content denoted by network address is added to the index, block 14024. As introduced above, the index may well be maintained locally, e.g., within content handler 401, or remotely, e.g., at document delivery server 100. Alternatively, the index may well be

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maintained within document delivery system 10, e.g., at knowledge module 170. As before, the process continues with block 14020, wherein content handler determines whether any additional (i.e., subscribe) action designators were received with respect to the retrieved document. If so, the process continues with block 14026.

5           If the action designator of the command received from server 100 includes the “subscribe” command, content handler 401 adds the network address and/or denoted content to a print schedule to automatically subscribe the user to receive the content on a periodic (e.g., weekly, monthly, quarterly, or as available, etc.) basis, block 14028. In accordance with the teachings of the present invention, upon receiving a  
10       “subscribe” action designator, controller 402 invokes an instance of index/subscribe function 406 to add the denoted content to the print schedule. As described above, the print schedule may well be maintained locally, e.g., within content handler 401 or, alternatively within the document delivery network, e.g., at document delivery server 100, print module 380 or devices 300.

15           In an alternate embodiment of the subscribe function, content handler 401 is used to subscribe users with independent content providers using the user profile maintained within document delivery system 10. In accordance with this alternate embodiment, index/subscribe function 406 accesses the user profile information from an appropriate data store, and provides the content provider with the information  
20       required to subscribe the user to the content from the independent content provider, thereby relieving the user from doing so. While this may seem like an extraneous function for the document delivery system 10, it is a value added service for users of the document delivery system 10 helping to build brand equity and user loyalty. In this regard, the alternate embodiment has business value.

25           Fig. 16 graphically illustrates an alternate user interface incorporating the teachings of the present invention. More particularly, Fig. 16 shows an example of how the teachings of the present invention may be translated for use in an email application, wherein an email is the user interface (in place of a web page, for example). In accordance with the illustrated example embodiment of Fig. 16, an  
30       email 16000 is depicted including an address/header area and a body. Within the body is a textual message and one or more iconic selector(s) 16002-16006. In particular two alternate “types” of iconic selector is illustrated including (1) hypertext links, or

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calls, such as the ones denoted above (calls 2-5) (16002, 16004), and a textual iconic selector 16006. More particularly, a hypertext iconic selector is presented to implement the automated index function 16002 and the automated download function 16004, while iconic selector 16006 associated with the automated subscribe function “hides” the associated call from the purview of the user. User selection of one or more of these iconic selectors 16002-16006 selectively invokes an appropriate one or more functions 404-408 of content handler 401, as discussed above. Although not depicted, it will be appreciated that an email system supporting HTML instructions may well utilize the graphical iconic selectors as in Fig. 15. It should be appreciated, based on the foregoing, that additional functions may well be added to content handling system without deviating from the spirit and scope of the present invention.

Referring again to Fig. 7, a print schedule of document 13000 is shown. Document 13000 is referred to as a “personalized document”. A “personalized document” is a document that is assembled by edit module 120 of document server 100 from a variety of content providers 50 and advertising providers 80, based on information contained in the user profile stored in knowledge module 170. For example, document 13000 is a “personalized document”. Our user has requested that document 13000 – his personalized newspaper – be printed at 6:00 a.m. every day. Edit module 120 examines the user’s interests as specified in the user profile stored in knowledge module 170 to assemble the document from selected content providers 50 in which the user has indicated an interest. Edit module 120 also inserts advertising from selected advertising providers 80 – again based on the user profile stored in knowledge module 170.

Fig. 8 shows how the print schedule 390 of Fig. 7 can be edited by the user. The user can use the publisher’s recommended schedule, use a default schedule the user has set, or use a custom schedule for delivery. If a custom schedule is selected, the user can select a daily, weekly, or monthly delivery, or select a delivery once every specified number of days, or specify every weekday. In addition, the time of day can also be specified: once at a designated time, multiple times during the day, or multiple times separated by a specified period of time. While not shown here, the user could also edit print schedule 390 to request that a document be sent upon creation, or upon the occurrence of an external event.

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Figs. 9A-9B show document 11000 printed by the printing device according to one embodiment of the invention. Note that this document came from one content provider 50 via network 200 (either through document server 100 or directly), and contains no advertising. While document 11000 is preferably formatted by content provider 50 such that the information contained in the document is optimized to be printed, such formatting is not necessary.

Fig. 10 shows document 12000 printed by the printing device according to one embodiment of the invention. Note that this document is a user's daily calendar which came directly from device 300 and not from document server 100 via network 200.

Figs. 11A-D show document 1300 printed by the printing device according to one embodiment of the invention. Note that this document is a user's personalized newspaper which contains information in which the user has indicated a specific interest in, as stored in the user profile in knowledge module 170. Note also that this document contains advertising that edit module 120 determined the user would also be interested in, again based on the information contained in the user profile stored in knowledge module 170. As has already been discussed, when the user prints a sufficient number of such "preferred" documents, the user may receive a product subsidy of a print consumable or other product(s).

Fig. 12 shows document 14000 printed by the printing device according to one embodiment of the present invention. Note that document 14000 is the HP Instant Delivery Times – a document located on document server 100. While this document does not contain advertising per se, it is still considered to be a "preferred document", since it is under the control of edit module 120. Document 14000 informs users of Instant Delivery of new releases or new information about the Instant Delivery Program.

What is claimed is:

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